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Published in:
The Journal of Open Source Software

DOI (link to publication from Publisher):
10.21105/joss.01763

Publication date:
2019

Document Version
Publisher's PDF, also known as Version of record

The Journal of Open Source Software

Ryacas: A computer algebra system in R

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DOI: 10.21105/joss.01763

Software

- Review
- Repository
- Archive

Submitted: 29 July 2019
Published: 09 October 2019

Summary

Ryacas is an R (R Core Team, 2018) package that enables a computer algebra system (CAS) within R via the open source CAS yacas (A. Z. Pinkus & Winitzki, 2002; A. Pinkus, Winnitzky, & Mazur, 2016), which is short for "**y**et **a**nother **c**omputer **a**lgebra **s**ystem".

Ryacas includes both a high-level (symbol) interface using R objects like matrices and vectors as well as direct access to the underlying yacas such that the user can use the full yacas system, including for example defining new summation rules.

From a statistician's perspective, Ryacas does provide convenient tools directly in R like

- sums,
- limits,
- differentiation,
- integration,
- symbolic matrices and vectors,
- simplification, and
- outputting in TeX format,

which are helpful in both research and teaching. With Ryacas, these tools are conveniently available from within R through Ryacas. However, it must be stressed that yacas is nowhere as powerful as the larger commercial CASs.

yacas is easy to use and extensible so that the user can define new rules, for example for simplification or summations. More information about yacas is available at http://www.yacas.org/.

Ryacas contains a number of vignettes that describe both how to use the high-level interface directly with R objects and how to use the underlying yacas system.

Ryacas contains a version of yacas which is bundled into Ryacas using Rcpp (Eddelbuettel & Balamuta, 2017). This means that Ryacas can be installed like any other R package with no special installation steps being required.

References

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